

Architecture Modeling Approach for Net-Centric Enterprise Services

(C4ISR/C2 Architecture Track, Paper #60)

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- NCES Mission Threads
- Architecture Modeling Approach
- Sample: Time Sensitive Targeting
- Summary

Purposes of Mission Threads

- Demonstrate that NCES Core Enterprise Services can support Department of Defense missions.
- Validate NCES capabilities (requirements) for mission threads
- Develop Executable Architecture Models to validate NCES Service-Oriented Architecture.

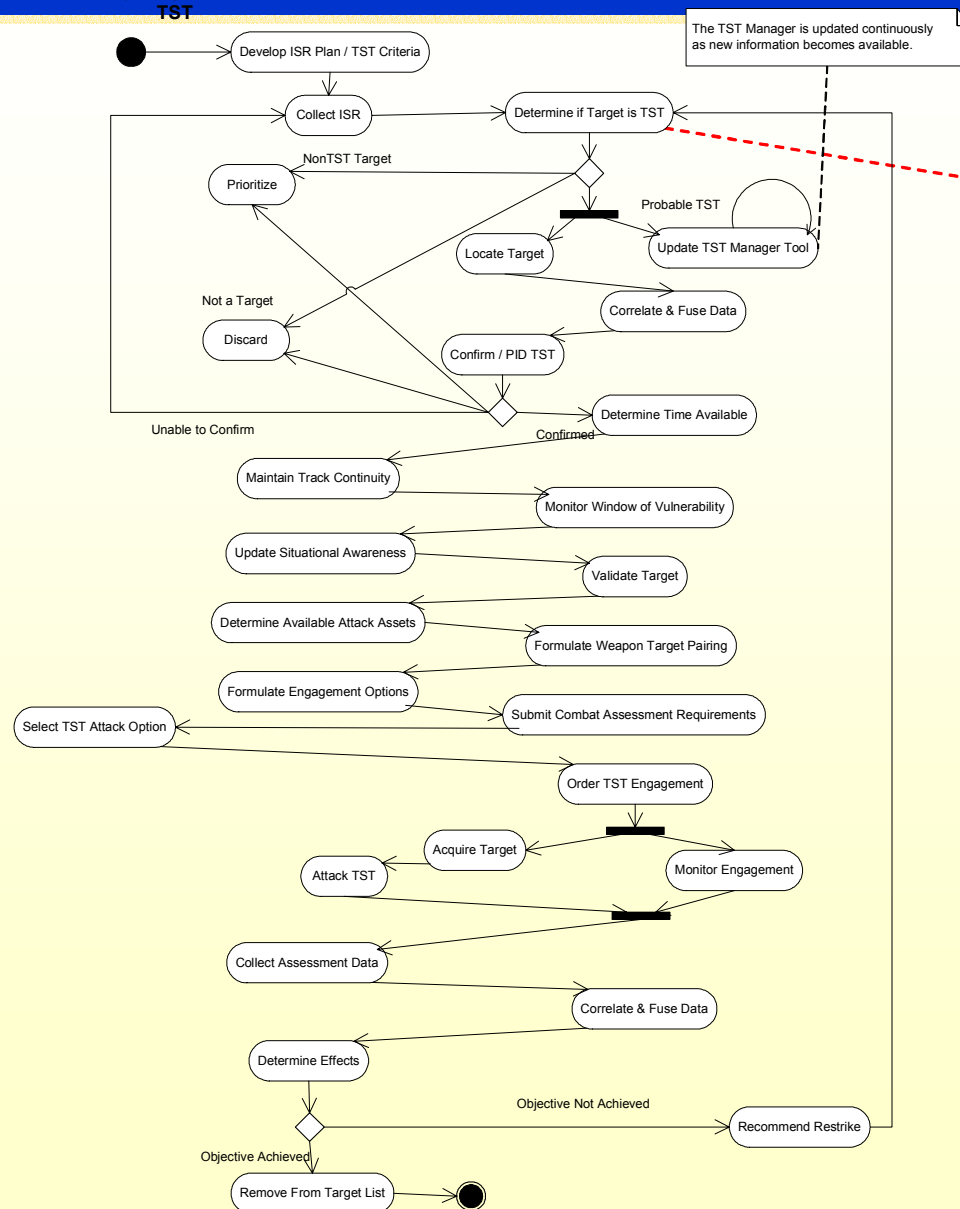
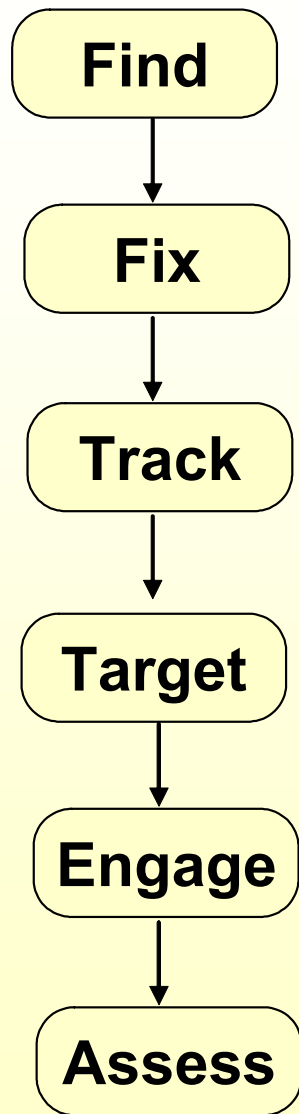
Summary of Approach

1. Formulate activity models for a mission thread.
2. Map the activities to NCES and existing systems.
3. Develop logical deployment architecture with NCES included.
4. Develop logical data models.
5. Construct executable architecture models.

Time-Sensitive Targeting Activity Model

Activity Diagram (OV-5):

TST



Determine if Target is TST

Operational Activity Descriptions (“Find” Phase)

Only First Three Activities Shown Here

Activity	Description
Develop ISR Plan/TST Criteria	Based on JFC TST guidance and initial preparation of battlespace (IPB), develop an Intelligence, Surveillance and Reconnaissance (ISR) plan to deploy sensors to identify potential TSTs.
Collect ISR	Use all available sensor data to identify, locate, and prioritize emerging targets.
Determine if Target is TST	Use further ISR to determine if emerging target is a TST. The final decision is made by the TST Cell Chief.

Operational Activity to System Function (SV-5)

Core Enterprise Services & Existing Systems

Activities in the Six Phases

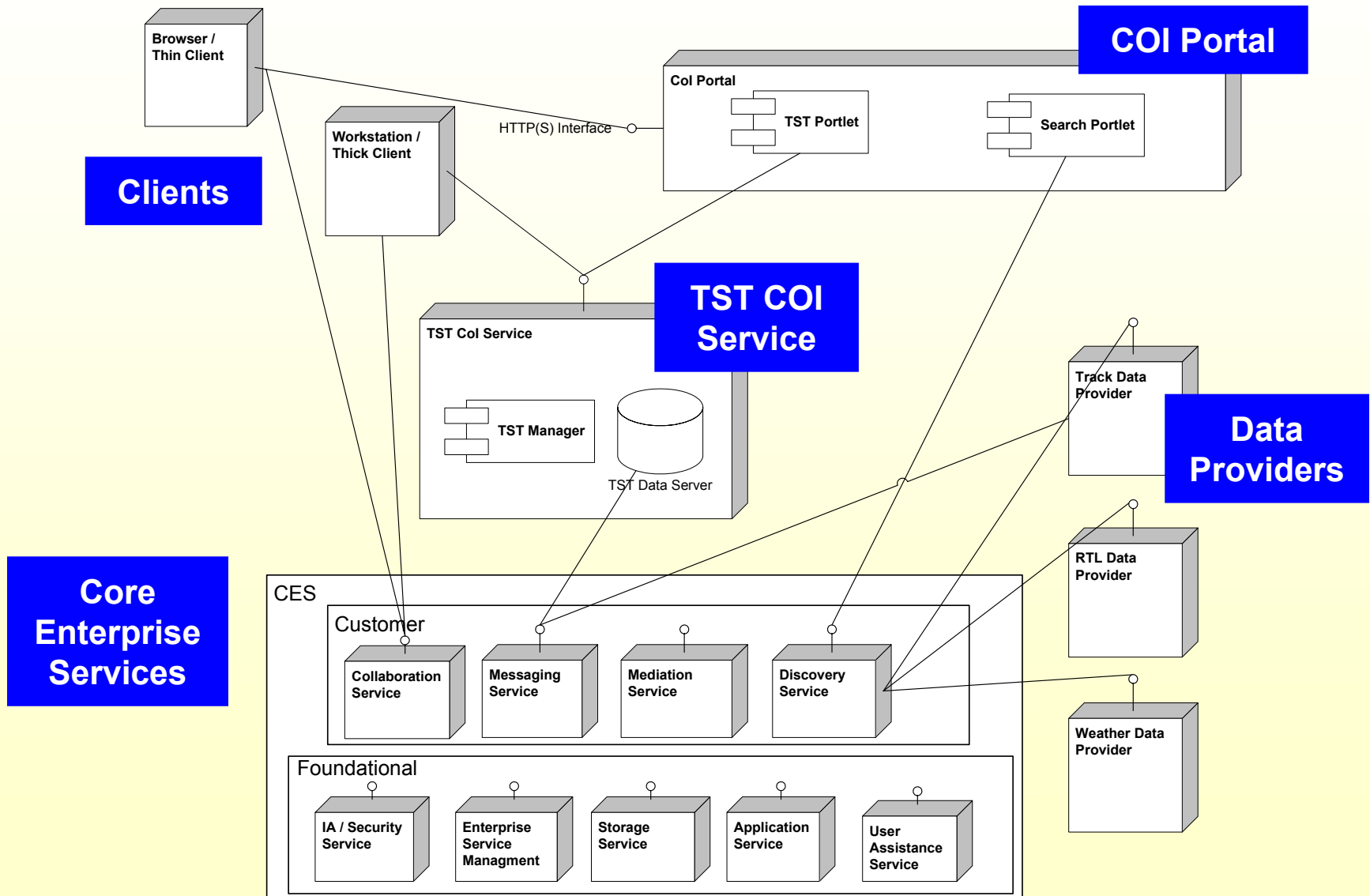
Activities to Function Mapping for Time-Sensitive Targeting (SV-5)

Activities in the Six Phases																																			
FIND Phase	Develop ISR Plan/TST Criteria	Collect ISR	Determine if Target is TST	Fix Target	Discard	Prioritize	FIX Phase	Locate Target	Correlate and Fuse Data	Confirm /PID TST	Determine time available	TRACK Phase	Maintain Track Continuity on the	Monitor Window of Vulnerability	Update Situational Awareness	TARGET Phase	Validate Target	Determine Available Attack Assets	Match Available Attack Assets	Formulate Weapon Target Pairing	Formulate Engagement Options	Submit Combat Assessment Request	Select TST Attack Option	ENGAGE Phase	Order TST Engagement	Monitor Engagement	Attack TST	ASSESS Phase	Collect Assessment Data	Determine Effects	Correlate and Fuse Data	Retarget	Remove From Target List		
Legend: P=Portlets via Browser, C=Client App (Thick), S=Service-to-Service, M=System-to-Service. Cells in gray are common across Operational Activities.																																			
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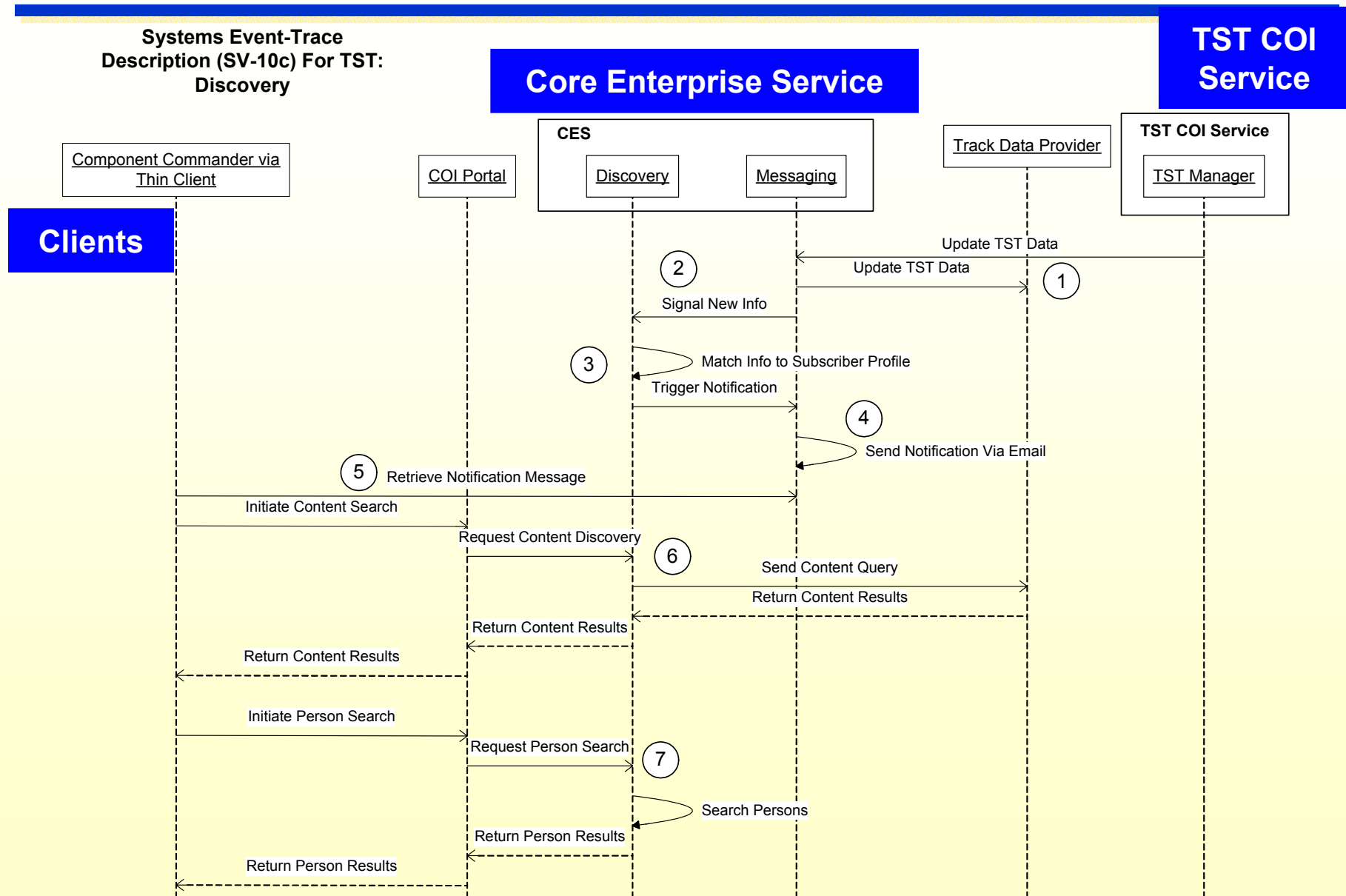
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Notional System Interface Description (SV-1)

Notional To-Be Systems Interface (SV-1) For TST

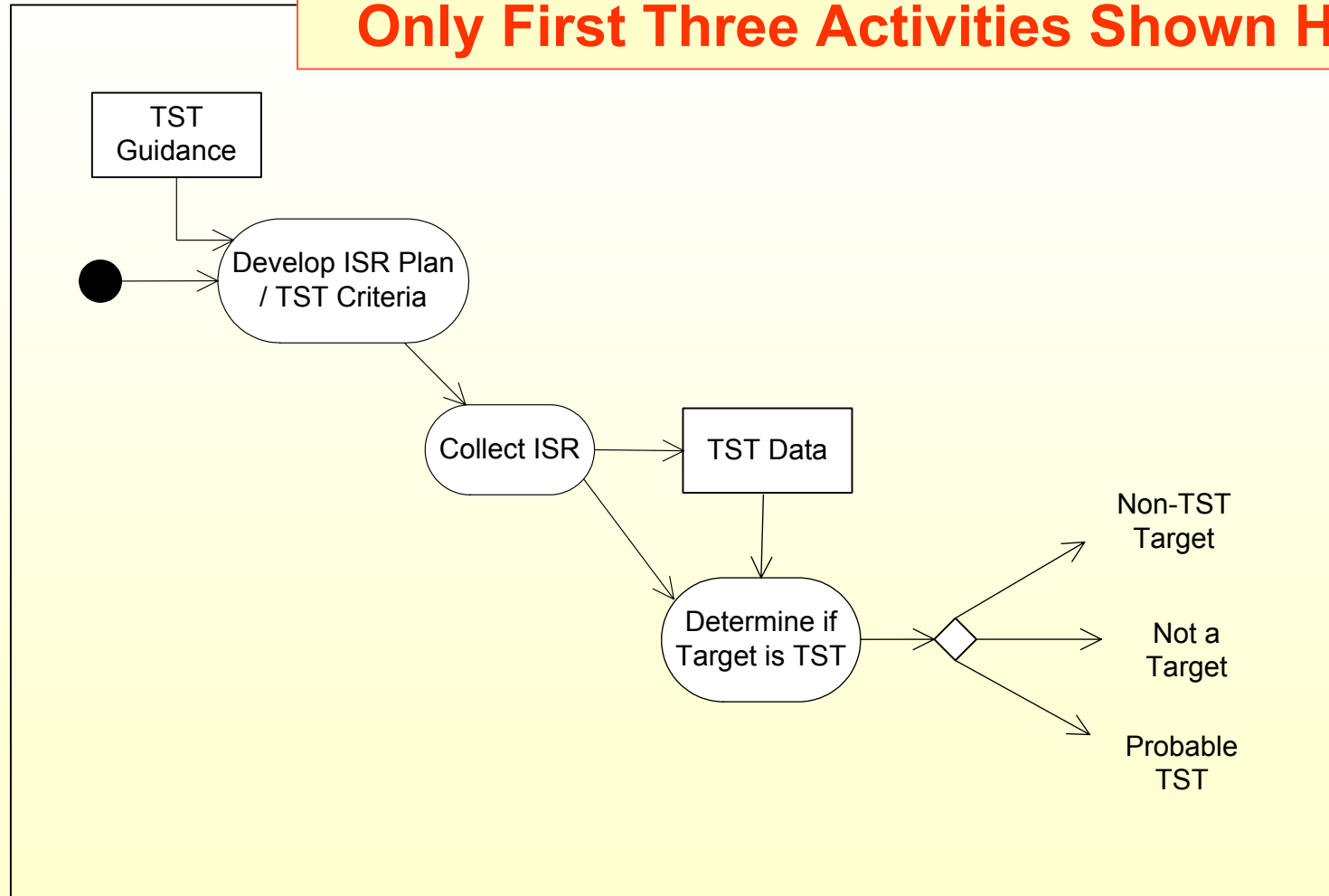


Notional Event-Trace Description (SV-10c)



Executable Architecture Model for TST

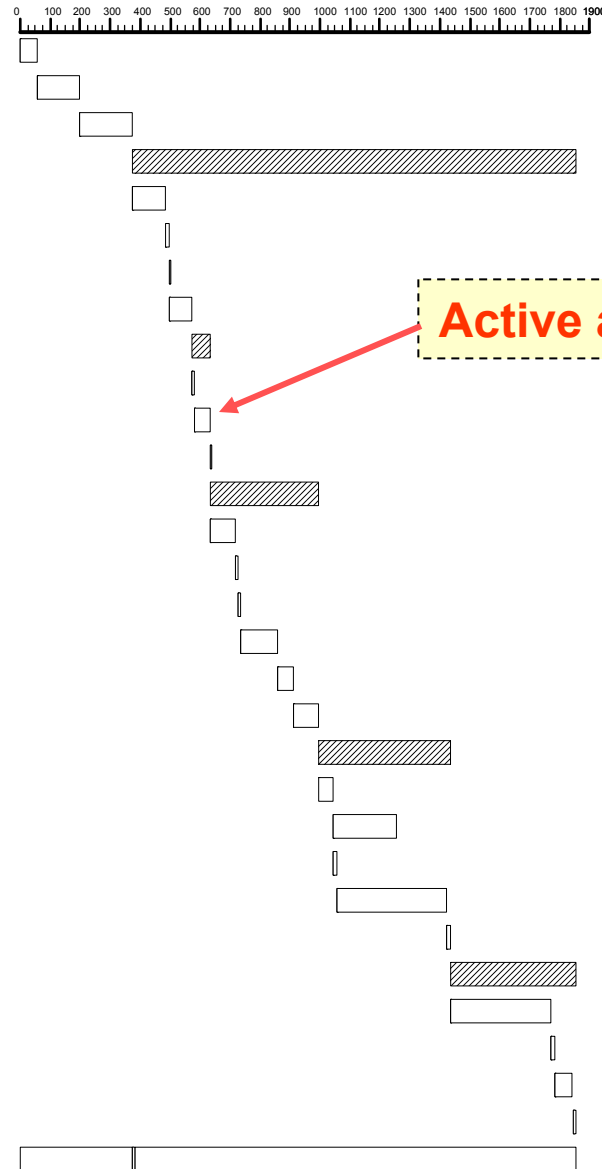
Only First Three Activities Shown Here



Model Execution Timeline (example)

TST Activities

TST.1 Develop ISR Plan / TST Criteria
 TST.2 Collect ISR data
 TST.3 Determine if Target is TST
 TST.5 Fix through Assess Phases
 TST.5.1 Locate Target
 TST.5.2 Correlate & Fuse Data
 TST.5.3 Confirm / PID TST
 TST.5.6 Dertermine Time Available
 TST.5.7 Track Phase
 TST.5.7.1 Maintain Track Continuity on the TST
 TST.5.7.2 Monitor Window of Vulnerability
 TST.5.7.3 Update Situational Awareness
 TST.5.8 Target Phase
 TST.5.8.1 Validate Target
 TST.5.8.2 Determine Available Attack Assests
 TST.5.8.3 Formulate Weapon Target Pairing
 TST.5.8.4 Formulate Engagement Options
 TST.5.8.5 Submit Combat Assessment Requirements
 TST.5.8.6 Select TST Attack Option
 TST.5.9 Engage Phase
 TST.5.9.1 Order TST Engagement
 TST.5.9.2 Monitor Engagement
 TST.5.9.3 Acquire Target
 TST.5.9.4 Attack TST
 TST.5.9.5 Initiate Assessment
 TST.5.10 Assess Phase
 TST.5.10.1 Collect Assessment Data
 TST.5.10.2 Correlate & Fuse Data -Assess
 TST.5.10.3 Determine Effects
 TST.5.10.4 Remove From Target List
 TST.7 Update TST Manager Tool



Active activities

Operational Mission Threads

Warfighter Mission Areas:

- **Time Sensitive Targeting (USJFCOM/SPAWAR/USA G-6)**
- **Focused Logistics/Deployment (USJFCOM/USTRANSCOM)**
- **Joint Close Air Support (USJFCOM)**
- **Global Strike (USAF/USSTRATCOM)**
- **Blue Force Tracking (USA)**

Business Mission Area:

- **Personnel/Military Pay (HRM Domain)**

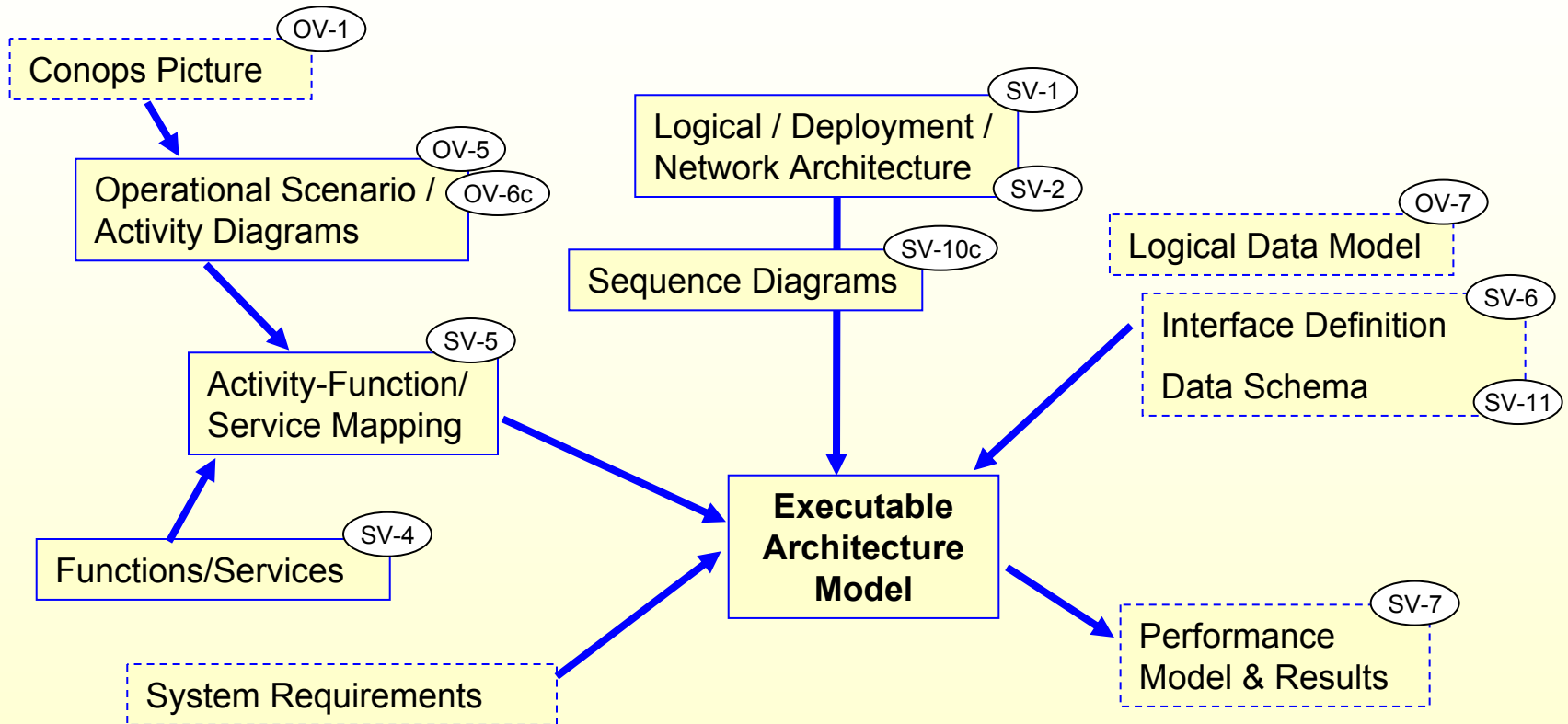
Usage of Core Enterprise Services

Mission Threads	TST	Flog/D	JCAS	GS	BFT	MilPay/D	Subtotal
Messaging Services	9	6	9	5	1	1	30
Discovery Services	5	8	3	4	1	0	21
Collaboration Services	14	5	11	8	0	1	39
Mediation Services	8	7	3	3	1	0	21
User Assistant Services							
Application Services							
IA/ Security Services							
Enterprise Services Mgmt							
Storage Services							

Shaded area for foundational services

Average number of activities using a service

Architecture Modeling Methodology



End of Presentation
